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Decommissioning the Reactor Facility: Results of NASA's Environmental Assessment

This is one in a series of fact sheets prepared by NASA Glenn Research Center (NASA) to provide the public with information about decommissioning the closed Reactor Facility at Plum Brook Station. In accordance with the National Environmental Policy Act (NEPA), NASA conducted an Environmental Assessment (EA) of its preferred action for decommissioning. This fact sheet describes the EA results.

Purpose

The purpose of an Environmental Assessment (EA) is to describe a federal agency's proposed actions or activities that may possibly have a significant impact on the human environment. An EA concisely documents possible environmental impacts of the proposed action and determines measures to reduce or eliminate impacts.

NASA's Preferred Alternative

Decontaminate the Reactor Facility to radiation levels consistent with the NRC's unrestricted release criteria. Take measurements to verify that decontamination is complete, Demolish the buildings and regrade the area. Request that the NRC terminate the license without restrictions

The closed Reactor Facility is a 27-acre area located in the northern portion of the 6,400 acre Plum Brook Station. After eleven years of operating under strict safety precautions and continuous monitoring, the nonpower, research Reactor Facility was shut down in 1973. The fuel was removed to a U.S. Department of Energy facility and the reactors were placed in safe, secure, and dry storage mode. NASA has no further need to use the Reactor Facility in support of its mission at Plum Brook Station and has presented its proposed action to the Nuclear Regulatory Commission (NRC) for decommissioning the Reactor Facility and terminating its "Possess But Do Not Operate" license.

Results of NASA's Environmental Assessment show that there are No Significant Impacts associated with implementing NASA's proposed action for decommissioning the former Reactor Facility.

NASA's Environmental Assessment (EA)

NASA's EA evaluated three alternatives for decommissioning:

1. Prompt decontamination and decommissioning
2. Entombing the Plum Brook Reactor Facility in concrete to allow radioactive decay and then decontaminate and decommission at a later date
3. No Action alternative (this alternative is required by NEPA) that would leave the facility in its current state

NASA's preferred alternative is the prompt decontamination and decommissioning alternative. NASA selected this alternative because it is the safest and most thorough alternative that would reduce residual radiation levels at the Reactor Facility so that the site could be used safely for any purpose in the future.

Following National Environmental Policy Act (NEPA) guidance, the EA focused on only those aspects of the environment that could be impacted by the proposed action which include:

- Topography, Geology, and Soils
- Background Radiation Levels
- Climate and Air Quality
- Hydrology & Groundwater, Drinking Water, Surface Water, Wetlands and Floodplains
- Biologic Resources
- Waste Management
- Population and Land Use
- Cultural and Historical Resources
- Socioeconomic and Environmental Justice
- Transportation
- Noise
- Seismicity

No Significant Impacts Identified

NASA's EA concluded that the preferred decommissioning alternative would not have a significant effect on the human environment. NASA will publish its Finding of No Significant Impact (referred to as FONSI), in the U.S. Federal Register. An Environmental Impact Statement (EIS) is not needed because no significant impacts were identified.

Environmental Impacts Associated with the Proposed Action

The EA identified some minor environmental impacts that would be created during implementation of decommissioning: waste disposal, air and water discharges, and a greater volume of local traffic. The EA concluded that these impacts would all be small, highly localized, and temporary. In addition, measures to prevent pollution and engineering controls would be used during decommissioning to reduce these impacts.

Waste Management

The primary environmental impact associated with decommissioning the Reactor Facility would be from disposing of radioactive and nonradioactive waste at licensed facilities. Only a small volume of hazardous waste would be generated, mostly from removing lead paint prior to demolition of the Reactor Facility buildings.

Strict government regulations and industry standards require that all waste be packaged in containers that prevent them from causing any public health or environmental problems. The waste would be removed by a licensed contractor and disposed of at a licensed waste facility. Transportation would be conducted in accordance with applicable U.S. Department of Transportation, U.S. EPA, and NRC regulations.

Plum Brook Station Sandusky, Ohio

Air

Mobile sources such as backhoes, cranes, trucks and cars would release emissions such as carbon monoxide and nitrogen oxides. The impact of these emissions is expected to be minimal, localized and short-term. Increased amounts of dust (particulates) would be generated from digging and hauling material such as soil and concrete. These would be controlled using conventional engineering practices such as dust suppression (for nonradiological waste) during demolition and covered trucks to reduce or prevent spillage and wind erosion during transport.

Water

Excavation necessary to decommission the Reactor Facility would result in increased runoff and downstream sedimentation to surface water on-site at Plum Brook Station. Standard erosion and sediment control practices, such as permanent or temporary soil stabilization to disturbed areas, or nonvegetative soil stabilization practices, such as mulching and matting, will be used to limit soil loss. After excavation, the ground surface would be regraded, reseeded, and revegetated, using native plant and grass species. NASA will develop a Storm Water Pollution Prevention Plan for the construction site and submit to Ohio EPA a Notice of Intent for stormwater discharges from the demolition site. Aspects of the project impacting stormwater discharges will not commence until Ohio EPA requirements are met.

Traffic

Additional vehicles (from about 100 decommissioning workers) and trucks transporting equipment and removing waste (an additional one to two trips per week) would increase the volume of local traffic for a short period of time. NASA would work with the local community to ensure safety and minimize disturbances to everyday activities. Any waste transported by rail would be trucked to the closest railroad, located 10 miles southwest of Plum Brook Station in Bellevue, and transported to either the Envirocare licensed site in Clive, Utah, or the Chem Nuclear licensed site in Barnwell, South Carolina.

Cumulative Effects

An important part of the EA was to evaluate potential cumulative impacts from projects in the vicinity of the reactor facility that might occur at the same time as decommissioning. Some of the projects include:

- Widening of Route 250, which borders the eastern boundary of Plum Brook Station
- Relocation of two NASA Glenn facilities from Cleveland to Plum Brook Station
- Construction of a housing development along Taylor Road near the entrance to Plum Brook Station.

Cumulative impacts on Plum Brook Station itself would be minimal. The Route 250 widening project would have more environmental impact on the airshed and traffic in the local area than the Proposed Action, because of the magnitude of the project and the associated disturbed land and traffic congestion.

Noise

Increased noise would result from construction equipment on-site during decommissioning. Workers would be outfitted with hearing protection devices. The site is far enough away from off-site receptors (3,000 ft.) that there would be no noise disturbance to the public.

Biologic Resources

There were no endangered species located at the Reactor Facility site. Plant and animal communities along the creek or in areas to be excavated would temporarily lose their habitat. These populations would reestablish themselves after earthmoving activities ceased.

Human Health Effects

The EA identified some possible minor impacts to human health associated with exposure to radiation during decommissioning. In all cases, the estimated exposure levels are small and well within levels considered safe by the NRC. Workers would be exposed to direct radiation and airborne radioactivity. The average annual radiation dose to decommissioning workers is estimated to be 500 mrem/yr, which is 10 times below the regulatory limit of 5,000 mrem/yr. Workers would be well trained in safe work practices and wear protective clothing, including a dosimeter, referred to as a "film badge," which measures accumulated radiation and ensures that exposure levels are kept within safe and legal limits.

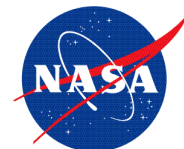
Exposure to the public off-site is estimated to be small, coming from routine releases during decommissioning activities and when the waste is shipped off-site for disposal. The dose is expected to be small (below measurable levels) because of the protection measures that will be taken to limit discharges to the air and surface water. After the license has been terminated, the potential public exposure is expected to be much less than the NRC's unrestricted use level (25 mrem/yr) since the decommissioning will be more extensive than required by NRC. In addition, public exposure in the vicinity of the Reactor Facility following decommissioning will not occur, since NASA intends to keep the property as part of Plum Brook Station.

Public Participation

NASA shared the results of the EA with its 14-member Community Workgroup, and as always, values continued input on plans for decommissioning the former Reactor Facility. The availability of the EA will be advertised in local papers. The public is encouraged to review the document and provide feedback to NASA during the 30-day public review and comment period. A copy of the EA, along with all documents concerning the decommissioning process, can be found in the Community Information Bank at BGSU Firelands, or by visiting the NASA Glenn Decommissioning website at www.grc.nasa.gov/www/pbrf.

The estimated exposure levels are small and well within levels considered safe by the regulatory agencies.

Everyone is continuously exposed to radiation from natural sources, such as the sun (cosmic rays), radon from the ground, and elements in soil, water and food. Man-made sources of radiation include medical x-rays, nuclear medicine procedures, and consumer products. On average, a person in the United States receives approximately 300 mrem/yr from natural sources of radiation and 60 mrem/yr from man-made sources of radiation for a total of 360 mrem/yr.



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